ABSTRACT

A method to create a polysilicon layer with large grains and uniform grain density is described. A first amorphous silicon layer is formed. A crystallizing agent is selectively introduced in a substantially symmetric pattern, preferably symmetric in two dimensions, across an area of the first amorphous layer. The crystallizing agent may be, for example, silicon nuclei, germanium, or laser energy. A mask layer is formed on the amorphous silicon layer, and holes etched in the mask layer in a symmetric pattern to expose the amorphous layer to, for example, silicon nuclei or germanium) only in the holes. The mask layer is removed and a second amorphous layer formed on the first. If laser energy is used, no mask layer or second amorphous layer is generally used. The wafer is annealed to form a polysilicon layer with substantially no amorphous silicon remaining between the grains.